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10/566,913	02/03/2006	Wolfgang Dahms	B-7252	4573

7590 11/12/2009
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EXAMINER

WONG, EDNA

ART UNIT	PAPER NUMBER
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1795

MAIL DATE	DELIVERY MODE
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11/12/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/566,913	Applicant(s) DAHMS ET AL.	
	Examiner EDNA WONG	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 and 24-28 is/are pending in the application.
- 4a) Of the above claim(s) 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20, 24-26 and 28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>March 27, 2006</u> | 6) <input type="checkbox"/> Other: _____ |

Election/Restrictions

Applicant's election with traverse of Group I, claims **1-20 and 28**, in the reply filed on April 21, 2009 is acknowledged. The traversal is on the ground(s) that:

(i) The Group I invention should at least include the Group II claims 24-26 (Group II invention). This is found persuasive. Claims **24-26** are fully examined for patentability.

(ii) The Group III invention (claim **27**) is withdrawn from consideration as being directed to a non-elected invention.

The requirement is still deemed proper and is therefore made FINAL.

Specification

The disclosure is objected to because of the following informalities:

page 4, line 30, reference to "claim 1" should be deleted because it is improper for the specification to refer to the claims.

page 4, line 31, reference to "claim 24" should be deleted because it is improper for the specification to refer to the claims.

page 4, line 31, reference to "claims 21 and 22" should be deleted because it is improper for the specification to refer to the claims. Claims 21 and 22 are cancelled claims.

Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

Claims **25 and 26** are objected to because of the following informalities:

Claim 25

line 1, the claim is dependent on cancelled claim 23.

Claim 26

line 1, the claim is dependent on cancelled claim 23.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

I. Claims **16 and 20** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 16

line 2, “the at least one nitrogen-containing thio compound” lacks antecedent basis. It is suggested that the word -- organic, -- be inserted after the word “one”.

Claim 20

line 5, the alternative expression of the Markush group is improper (MPEP § 2173.05(h)). The word “and” should be inserted after the compound “N-acetyl polyethylene imine,”.

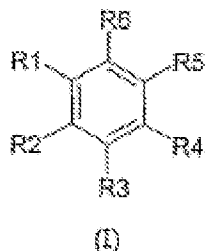
II. Claims **1-20, 24-26 and 28** are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: copper.

Claim 1

lines 1-2, the preamble recites “An aqueous acidic solution for electrolytically depositing copper coatings”. However the solution, recited in the body of the claim, does not contain any copper.

lines 3-11, recites “characterized in that the solution additionally contains at least one aromatic halogen derivative having the general formula:

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wherein R1, R2, R3, R4, R5 and R6 are each independently radicals selected from the group consisting of hydrogen, aldehyde, acetyl, hydroxy, hydroxyalkyl having 1- 4 carbon atoms, alkyl having 1-4 carbon atoms and halogen, with the proviso that the number of radicals R1, R2, R3, R4, R5 and R6 which are halogen ranges from 1-5”.

If R1, R2, R3, R4, R5 and R6 are each independently hydrogens, then how is the aromatic halogen derivative halogenated?

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

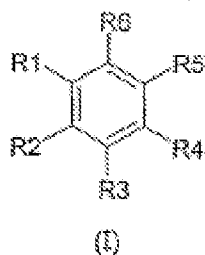
Solution

I. Claims **1-3, 8-16, 19-20 and 28** are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Cobley et al.** (US Patent No. 6,652,731 B2).

Cobley teaches an aqueous acidic solution for electrolytically depositing copper coatings, said solution containing:

- at least one oxygen-containing, high molecular additive (= an oxygen containing high molecular weight compound) [col. 8, lines 20-29]; and
- at least one water soluble sulfur compound (= an additive brightener) [col. 8, lines 4-19],

characterized in that the solution additionally contains at least one aromatic halogen derivative having the general formula:



wherein R1, R2, R3, R4, R5 and R6 are each independently radicals selected from the group consisting of hydrogen, aldehyde, acetyl, hydroxy, hydroxyalkyl having 1- 4 carbon atoms, alkyl having 1-4 carbon atoms and halogen, with the proviso that the number of radicals R1, R2, R3, R4, R5 and R6 which are halogen ranges from 1-5 (= an

aromatic aldehyde having the following formula: $R^1\text{-CHO}$, e.g., 2-chloro-4-hydroxybenzaldehyde) [col. 5, line 49 to col. 6, line 36].

The concentration of the at least one aromatic halogen derivative ranges from about 0.005-about 0.9 mg/l (= from about 0.001 g/L to about 100 g/L) [col. 6, lines 60-67].

The aldehyde is selected from the group consisting of formyl (-CHO), methylformyl ($\text{-CH}_2\text{-CHO}$) and ethylformyl ($\text{-C}_2\text{H}_4\text{-CHO}$) [= an aromatic aldehyde having the following formula: $R^1\text{-CHO}$] [col. 5, line 49 to col. 6, line 36].

The at least one oxygen-containing, high molecular additive is selected from the group consisting of comprising polyvinyl alcohol; carboxymethyl cellulose; polyethylene glycol; polypropylene glycol; stearic acid polyglycol ester; oleic acid polyglycol ester; stearyl alcohol polyglycol ether; nonylphenol-polyglycol ether; octanol polyalkylene glycol ether; octanediol-bis-(polyalkylene glycol ether); poly(ethylene glycol-ran-propylene glycol); poly(ethylene glycol)-block-poly(propylene glycol)-block-poly(ethylene glycol); and poly(propylene glycol)-block-poly(ethylene glycol)-block-poly(propylene glycol) [col. 8, lines 20-29].

The at least one water soluble sulfur compound is selected from the group consisting of comprising organic, nitrogen-free thio compounds and the salts thereof (col. 8, lines 4-19).

The salts contain alkali or earth alkali metal ions, selected from the group consisting of comprising sodium, potassium, magnesium and calcium (col. 8, lines 4-

19).

The at least one organic nitrogen-free thio compound is selected from the group consisting of comprising sodium salt of 3-(benzthiazolyl-2-thio)-propylsulfonic acid; sodium salt of 3-mercaptopropane-1-sulfonic acid; disodium salt of thiophosphoric acid-O-ethyl-bis-(ω -sulfopropyl)-ester; trisodium salt of thiophosphoric acid-tris-(ω -sulfopropyl)-ester; sodium salt of ethylenedithio dipropyl sulfonic acid; disodium salt of bis-(p -sulfophenyl)-disulfide; disodium salt of bis-(ω -sulfopropyl)-sulfide; disodium salt of bis-(ω -sulfopropyl)-disulfide, disodium salt of bis-(ω -sulfohydroxypropyl)-disulfide; disodium salt of bis-(ω -sulfobutyl)-disulfide; sodium salt of methyl-(ω -sulfopropyl)-disulfide; sodium salt of methyl-(ω -sulfobutyl)-trisulfide; potassium salt of O-ethyl-dithiocarbonic acid-S-(ω -sulfopropyl)-ester; and thioglycolic acid (col. 8, lines 4-19).

Acid is contained in the solution and that the acid is selected from the group consisting of comprising sulfuric acid, hydrochloric acid, fluoboric acid and methanesulfonic acid (= sulfuric acid) [col. 9, lines 40-50].

The solution additionally contains chloride ions (= as sodium chloride) [col. 9, lines 40-50].

The chloride ions have been added to the solution in the form of sodium chloride and/or of hydrochloric acid (= as sodium chloride) [col. 9, lines 40-50].

The solution additionally contains at least one organic, nitrogen-containing compound (col. 7, line 61 to col. 8, line 3).

The at least one nitrogen-containing thio compound is selected from the group

consisting of thiourea; N-acetylthiourea; N-trifluoroacetyl thiourea; N-ethylthiourea; N-cyanoacetyl thiourea; N-allylthiourea; o-tolylthiourea; N,N'-butylene thiourea; thiazolidine thiol-2; 4-thiazoline thiol-2; imidazolidine thiol-2-(N,N'-ethylene thiourea); 4-methyl-2-pyrimidine thiol; and 2-thiouracil (= thiourea) [col. 7, line 66].

The solution additionally contains at least one polymeric nitrogen compound (col. 7, line 61 to col. 8, line 3).

The at least one polymeric nitrogen compound is selected from the group consisting of comprising polyethylene imine, polyethylene imide, polyacrylic acid amide, polypropylene imine, polybutylene imine, N-methyl polyethylene imine, N-acetyl polyethylene imine, N-butyl polyethylene imine (col. 7, line 61 to col. 8, line 3).

Method

II. Claims **24-26** are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Cobley et al.** (US Patent No. 6,652,731 B2) as applied to claims 1-3, 8-16, 19-20 and 28 above.

Cobley is as applied above and incorporated herein.

Cobley also teaches a method of electrolytically depositing copper coatings on metal or plastic surfaces, comprising:

- bringing the surfaces **16** (= a workpiece) into contact with the solution **14** (= a metal plating bath) according to claim 1 and electrolytically depositing copper onto the surfaces (col. 11, lines 4-23).

The metal or plastic surfaces are printed circuit board material (col. 5, lines 1-14).

The method includes the step of moving said metal or plastic surfaces in vertical and/or horizontal conveyORIZED plating lines (col. 11, lines 24-32; and Fig. 2).

Solution

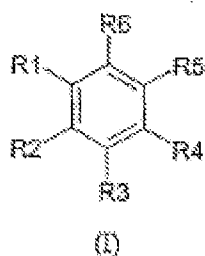
III. Claims **1-2, 4-16, 19-20 and 28** are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Gabe et al.** (US Patent No. 6,773,573 B2).

Gabe teaches an aqueous acidic solution for electrolytically depositing copper coatings, said solution containing:

- at least one oxygen-containing, high molecular additive (= an oxygen containing high molecular weight compound) [col. 9, lines 56-64]; and

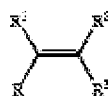
- at least one water soluble sulfur compound (col. 9, lines 34-55),

characterized in that the solution additionally contains at least one aromatic halogen derivative having the general formula:



wherein R1, R2, R3, R4, R5 and R6 are each independently radicals selected from the group consisting of hydrogen, aldehyde, acetyl, hydroxy, hydroxyalkyl having 1- 4

carbon atoms, alkyl having 1-4 carbon atoms and halogen, with the proviso that the number of radicals R¹, R², R³, R⁴, R⁵ and R⁶ which are halogen ranges from 1-5 (= an



alcohol including compounds having formula I: , where R¹ and R² are taken together along with the atoms to which they are attached to form a 5 to 7 membered carbon ring) [col. 5, line 66 to col. 6, line 60].

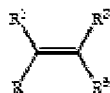
The concentration of the at least one aromatic halogen derivative ranges from about 0.005-about 0.9 mg/l (= from about 0.001 g/l to about 100 g/l) [col. 8, lines 32-40].

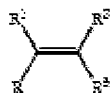
Alkyl is branched or unbranched and is selected from the group consisting of methyl, ethyl, n-propyl, iso-propyl, n-butyl, iso-butyl and tert-butyl (col. 6, lines 7-60).

The alkyl having 1-4 carbon atoms is hydroxyalkyl and that it is branched or unbranched (= a hydroxyl (C₁-C₂₀) linear, branched, or cyclic alkyl) [col. 6, lines 7-60].

At least one hydroxyalkyl is hydroxymethyl (= a hydroxyl (C₁-C₂₀) linear, branched, or cyclic alkyl) [col. 6, lines 7-60].

The at least one aromatic halogen derivative is selected from the group consisting of 2-chlorobenzaldehyde; 2-chlorophenol; 4-chloro-3-methylphenol; 2-chloro-4,5-dimethylphenol; 4-chloro-3,5-dimethylphenol; 4-chlorophenol; 3-chlorophenol; o-chloroacetophenone; 2-chlorobenzyl alcohol; 4-bromo-2,6-dimethylphenol; 4-bromophenol; 2,4-dichlorobenzyl alcohol; 2,6-dibromo-4-methylphenol; 2,5-dichlorophenol; 3,5-dibromobenzaldehyde; 2,5-dibromobenzoic acid; 2,4,6-trichlorophenol; and 2,3,6-trichlorobenzaldehyde (= an alcohol including compounds



having formula I: , where R¹ and R² are taken together along with the atoms to which they are attached to form a 5 to 7 membered carbon ring) [col. 5, line 66 to col. 6, line 60].

The at least one oxygen-containing, high molecular additive is selected from the group consisting of comprising polyvinyl alcohol; carboxymethyl cellulose; polyethylene glycol; polypropylene glycol; stearic acid polyglycol ester; oleic acid polyglycol ester; stearyl alcohol polyglycol ether; nonylphenol-polyglycol ether; octanol polyalkylene glycol ether; octanediol-bis- (polyalkylene glycol ether); poly(ethylene glycol-ran-propylene glycol); poly(ethylene glycol)-block-poly(propylene glycol)-block-poly(ethylene glycol); and poly(propylene glycol)-block-poly(ethylene glycol)-block-poly(propylene glycol) [col. 9, lines 56-64].

The at least one water soluble sulfur compound is selected from the group consisting of comprising organic, nitrogen-free thio compounds and the salts thereof (col. 9, lines 34-55).

The salts contain alkali or earth alkali metal ions, selected from the group consisting of comprising sodium, potassium, magnesium and calcium (col. 9, lines 34-55).

The at least one organic nitrogen-free thio compound is selected from the group consisting of comprising sodium salt of 3-(benzthiazolyl-2-thio)-propylsulfonic acid; sodium salt of 3-mercapto propane-1-sulfonic acid; disodium salt of thiophosphoric acid-

O-ethyl-bis-(ω -sulfopropyl)-ester; trisodium salt of thiophosphoric acid-tris-(ω -sulfopropyl)-ester; sodium salt of ethylenedithio dipropyl sulfonic acid; disodium salt of bis-(p -sulfophenyl)-disulfide; disodium salt of bis-(ω -sulfopropyl)-sulfide; disodium salt of bis-(ω -sulfopropyl)-disulfide, disodium salt of bis-(ω -sulfohydroxypropyl)-disulfide; disodium salt of bis-(ω -sulfobutyl)-disulfide; sodium salt of methyl-(ω -sulfopropyl)-disulfide; sodium salt of methyl-(ω -sulfobutyl)-trisulfide; potassium salt of O-ethyl-dithiocarbonic acid-S-(ω -sulfopropyl)-ester; and thioglycolic acid (col. 9, lines 34-55).

Acid is contained in the solution and that the acid is selected from the group consisting of comprising sulfuric acid, hydrochloric acid, fluoboric acid and methanesulfonic acid (= sulfuric acid) [col. 11, lines 7-18].

The solution additionally contains chloride ions (= as sodium chloride) [col. 11, lines 7-18].

The chloride ions have been added to the solution in the form of sodium chloride and/or of hydrochloric acid (= as sodium chloride) [col. 11, lines 7-18].

The solution additionally contains at least one organic, nitrogen-containing compound (col. 9, lines 24-33).

The at least one nitrogen-containing thio compound is selected from the group consisting of thiourea; N-acetylthiourea; N-trifluoroacetyl thiourea; N-ethylthiourea; N-cyanoacetyl thiourea; N-allylthiourea; o-tolylthiourea; N,N'-butylene thiourea; thiazolidine thiol-2; 4-thiazoline thiol-2; imidazolidine thiol-2-(N,N'-ethylene thiourea); 4-methyl-2-pyrimidine thiol; and 2-thiouracil (= thiourea) [col. 9, line 29].

The solution additionally contains at least one polymeric nitrogen compound (col. 9, lines 56-64).

The at least one polymeric nitrogen compound is selected from the group consisting of comprising polyethylene imine, polyethylene imide, polyacrylic acid amide, polypropylene imine, polybutylene imine, N-methyl polyethylene imine, N-acetyl polyethylene imine, N-butyl polyethylene imine (col. 9, lines 56-64).

Method

IV. Claims **24-26** are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over **Gabe et al.** (US Patent No. 6,773,573 B2) as applied to claims 1-2, 4-16, 19-20 and 28 above.

Gabe is as applied above and incorporated herein.

Gabe also teaches a method of electrolytically depositing copper coatings on metal or plastic surfaces, comprising:

- bringing the surfaces **16** (= a workpiece) into contact with the solution **14** (= a metal plating bath) according to claim 1 and electrolytically depositing copper onto the surfaces (col. 12, lines 45-58).

The metal or plastic surfaces are printed circuit board material (col. 4, line 65 to col. 5, line 12).

The method includes the step of moving said metal or plastic surfaces in vertical and/or horizontal conveyORIZED plating lines (col. 12, lines 59-67; and Fig. 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Solution

I. Claim **7** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Cobley et al.** (US Patent No. 6,652,731 B2) as applied to claims 1-3, 8-16, 19-20 and 28 above.

Cobley is as applied above and incorporated herein.

The solution of Cobley differs from the instant invention because Cobley does not disclose wherein the at least one aromatic halogen derivative is selected from the group consisting of 2-chlorobenzaldehyde; 2-chlorophenol; 4-chloro-3-methylphenol; 2-chloro-4,5-dimethylphenol; 4-chloro-3,5-dimethylphenol; 4-chlorophenol; 3-chlorophenol; o-chloroacetophenone; 2-chlorobenzyl alcohol; 4-bromo-2,6-dimethylphenol; 4-bromophenol; 2,4-dichlorobenzyl alcohol; 2,6-dibromo-4-methylphenol; 2,5-dichlorophenol; 3,5-dibromobenzaldehyde; 2,5-dibromobenzoic acid; 2,4,6-trichlorophenol; and 2,3,6-trichlorobenzaldehyde, as recited in claim **7**.

Cobley teaches an aromatic aldehyde having the following formula: R¹-CHO, e.g., 2-chloro-4-hydroxybenzaldehyde (col. 5, line 49 to col. 6, line 36).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the aromatic halogen derivative described by

Cobley with wherein the at least one aromatic halogen derivative is selected from the group consisting of 2-chlorobenzaldehyde; 2-chlorophenol; 4-chloro-3-methylphenol; 2-chloro-4,5-dimethylphenol; 4-chloro-3,5-dimethylphenol; 4-chlorophenol; 3-chlorophenol; o-chloroacetophenone; 2-chlorobenzyl alcohol; 4-bromo-2,6-dimethylphenol; 4-bromophenol; 2,4-dichlorobenzyl alcohol; 2,6-dibromo-4-methylphenol; 2,5-dichlorophenol; 3,5-dibromobenzaldehyde; 2,5-dibromobenzoic acid; 2,4,6-trichlorophenol; and 2,3,6-trichlorobenzaldehyde because structural relationships may provide the requisite motivation or suggestion to modify known compounds to obtain new compounds (MPEP § 2144.08(II)(A)(4)(c) and §2144.09).

II. Claims **17 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Cobley et al.** (US Patent No. 6,652,731 B2) as applied to claims 1-3, 8-16, 19-20 and 28 above, and further in view of **Todt et al.** (US Patent No. 3,743,584).

Cobley is as applied above and incorporated herein.

The solution of Cobley differs from the instant invention because Cobley does not disclose the following:

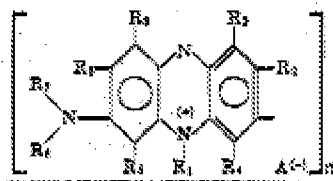
- a. Wherein the solution additionally contains at least one polymeric phenazinium compound, as recited in claim **17**.
- b. Wherein the at least one polymeric phenazinium compound is selected from the group consisting of poly(6-methyl-7-dimethylamino-5-phenyl-phenazinium sulfate); poly(2-methyl-7-diethylamino-5-phenyl-phenazinium chloride); poly(2-methyl-7-

dimethylamino-5-phenyl-phenazinium sulfate); poly(5-methyl-7-dimethylamino-phenazinium acetate); poly(2-methyl-7-anilino-5-phenyl-phenazinium sulfate); poly(2-methyl-7-dimethylamino-phenazinium sulfate); poly(7-methylamino-5-phenyl-phenazinium acetate); poly(7-ethylamino-2,5-diphenyl-phenazinium chloride); poly (2,8-dimethyl-7-diethylamino-5-p-tolyl-phenazinium chloride); poly(2,5,8-triphenyl-7-dimethylamino-phenazinium sulfate); poly(2,8-dimethyl-7-amino-5-phenyl-phenazinium sulfate); and poly(7-dimethylamino-5-phenyl-phenazinium chloride), as recited in claim **18**.

Cobley teaches that:

Aromatic and aliphatic quaternary amines also may be added to plating baths to improve deposit brightness. Dyes of the phenazine class (Safranine type) and phenazine azo dyes (Janus Green B type) may be employed as levelers. Polyethers are used to improve thickness and uniformity of metal plating (col. 8, lines 30-35).

Like Cobley, **Todt** teaches an acid copper electroplating bath. Todt teaches that an acid copper electrolyte which is characterized by a content of at least one compound of the general formula:



(col. 2, lines 7-22). One obtains an especially clear and sudden improvement of the luster and of the leveling effect by adding the substances according to the invention to copper electrolytes which contain as brighteners oxygen-containing, high molecular

compounds and organic thio compounds, preferably comprising one or more water-solubilizing group (col. 8, line 62 to col. 9, line 52).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solution described by Cobley with (a) and (b) above because adding at least one polymeric phenazinium compound would have improved the luster and the leveling effect of copper electrolytes as taught by Todt (col. 8, line 62 to col. 9, line 52).

III. Claims **17 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Gabe et al.** (US Patent No. 6,773,573 B2) as applied to claims 1-2, 4-16, 19-20 and 28 above, and further in view of **Todt et al.** (US Patent No. 3,743,584).

Gabe is as applied above and incorporated herein.

The solution of Gabe differs from the instant invention because Gabe does not disclose the following:

- a. Wherein the solution additionally contains at least one polymeric phenazinium compound, as recited in claim **17**.
- b. Wherein the at least one polymeric phenazinium compound is selected from the group consisting of poly(6-methyl-7-dimethylamino-5-phenyl-phenazinium sulfate); poly(2-methyl-7-diethylamino-5-phenyl-phenazinium chloride); poly(2-methyl-7-dimethylamino-5-phenyl-phenazinium sulfate); poly(5-methyl-7-dimethylamino-phenazinium acetate); poly(2-methyl-7-anilino-5-phenyl-phenazinium sulfate); poly(2-

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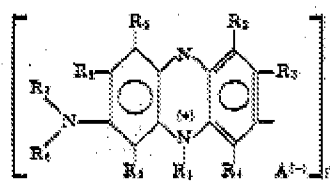
methyl-7-dimethylamino-phenazinium sulfate); poly(7-methylamino-5-phenyl-phenazinium acetate); poly(7-ethylamino-2,5-diphenyl-phenazinium chloride); poly (2,8-dimethyl-7-diethylamino-5-p-tolyl-phenazinium chloride); poly(2,5,8-triphenyl-7-dimethylamino-phenazinium sulfate); poly(2,8-dimethyl-7-amino-5-phenyl-phenazinium sulfate); and poly(7-dimethylamino-5-phenyl-phenazinium chloride), as recited in claim

18.

Gabe teaches that:

Aromatic and aliphatic quaternary amines also may be added to plating baths to improve deposit brightness. Dyes of the phenazine class (Safranine type) and phenazine azo dyes (Janus Green B type) may be employed as levelers. Polyethers are used to improve thickness and uniformity of metal plating (col. 9, line 65 to col. 10, line 3).

Like Gabe, **Todt** teaches an acid copper electroplating bath. Todt teaches that an acid copper electrolyte which is characterized by a content of at least one compound of the general formula:



(col. 2, lines 7-22). One obtains an especially clear and sudden improvement of the luster and of the leveling effect by adding the substances according to the invention to copper electrolytes which contain as brighteners oxygen-containing, high molecular compounds and organic thio compounds, preferably comprising one or more water-solubilizing group (col. 8, line 62 to col. 9, line 52).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solution described by Gabe with (a) and (b) above because adding at least one polymeric phenazinium compound would have improved the luster and the leveling effect of copper electrolytes as taught by Todt (col. 8, line 62 to col. 9, line 52).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EDNA WONG whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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